

WE CLAIM:

1. A carrier for containing a biomolecular interaction, said carrier comprising inorganic, organic or organic and inorganic material.
2. A carrier containing a biomolecular interaction, said carrier comprising inorganic, organic or organic and inorganic material.
3. A carrier according to claim 2 wherein the biomolecular interaction is incorporated within a matrix of the carrier.
4. A carrier according to claim 1 wherein the carrier comprises a silica based glass.
5. A carrier according to claim 3 wherein the material is a silicon, titanium, vanadium or cerium-based metal alkoxide, alkylated metal alkoxide or otherwise functionalized metal alkoxide or a corresponding metal chloride, silazane, polyglycerylsilicate or other silicate precursor .
6. A carrier according to claim 5 derived by a sol-gel processing method.
7. A carrier according to claim 6 wherein the biomolecular interaction is bioactive.
8. A carrier according to claim 7 wherein the carrier is bioactive.
9. A carrier according to claim 8 pre-treated to contain components found in an animal fluid.
10. A carrier according to claim 9 wherein the pre-treatment is by immersion in a solution containing components found in an animal fluid for a period of up to about seven days prior to use.

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18. A method according to claim 17 wherein the reacting occurs in an acidic or basic aqueous medium.

19. A method according to any one of claims 18 wherein the reactant and water are in a molar ratio of from about 1:1 to about 20:1 water/reactant.

20. A method according to claim 19 wherein the casting of the mixture is in a mold, a column, a microtiter well, a spot on a surface by pin spotting, inkjet deposition or screen printing ; or a film on a surface by dipcasting, spin-casting or spraying,

21. A method according to claim 20 wherein the gel and aging is at temperatures from about 0°C up to about 40°C.

22. A method according to claim 21 wherein the partial drying is at temperatures from about 4° to about 40°C.

23. A method for the preparation of a carrier having a bioactive bimolecular interaction incorporated in the carrier comprising:

- (a) incorporating the bioactive biomolecular interaction in the carrier;
- (b) hydrolysis and polycondensation of at least one monomer to provide a solid matrix bonding the bioactive biomolecular interaction which is incorporated in the carrier ; and
- (c) imparting mechanical, chemical and thermal stability in the matrix.

24. A method according to claim 23 wherein the at least one monomer is a functionalized or non-functionalized alkoxysilane; functionalized or non-functionalized bis-silane; functionalized or non-functionalized chlorosilane; sugar, polymer, polyol or amino acid substituted silicate; or additives selected from any available organic polymer, polyelectrolyte, sugar (natural or synthetic) or amino acids (natural and non-natural).

25. A method according to claim 24 wherein the monomer is based on titanium, vanadium or cerium.

26. A method according to claim 25 wherein mechanical, chemical and thermal stability is imparted by combination of precursors and additives.

27. A method according to claim 25 wherein mechanical, chemical and thermal stability is imparted by choice of aging and drying methods.

28. A method according to claim 25 wherein mechanical, chemical and thermal stability is imparted by combination of precursors and additives, and by choice of aging and drying methods.

29. A method according to claim 28 wherein the carrier comprises a silica based glass.

30. A method according to claim 29 wherein the carrier comprises a silicon, titanium, vanadium or cerium-based metal alkoxide, alkylated metal alkoxide or otherwise functionalized metal alkoxide or a corresponding metal chloride, silazane, polyglycerylsilicate or other silicate precursor .

31. A method according to claim 29 wherein the carrier is derived by a sol-gel processing method.

32. A method according to claim 31 wherein the carrier is bioactive.

33. A method of treating an animal comprising administering an effective amount of a biologically active biomolecular interaction contained in a carrier such that the animal is thereby treated.

34. A method according to claim 33 wherein the treating is by site-specific targeting in the animal.

35. A method according to claim 34 wherein the effective amount of a biologically active biomolecular interaction is a chemotherapeutic for treating cancer.

36. A method according to claim 35 wherein the carrier is a carrier according to claim 7.

37. A method for screening a compound to determine the degree of inhibition or binding of a biomolecular interaction by the compound comprising contacting the compound to be tested with the molecules of a biomolecular interaction wherein the molecules are incorporated within a carrier and they are capable of forming a biomolecular interaction in the carrier, and wherein inhibition of the formation of the biomolecular interaction or binding by the compound causes a change in the amount of a detectable signal produced by the molecules of the interaction of by one or more labels at or near the site of interaction of the molecules.

38. A method according to claim 37 wherein the biomolecular interaction is incorporated within a matrix of the carrier.

39. A method according to claim 38 wherein the carrier comprises a silica based glass.

40. A method according to claim 39 wherein the carrier is prepared from a silicon, titanium, vanadium or cerium-based metal alkoxide, alkylated metal alkoxide or otherwise functionalized metal alkoxide or a corresponding metal chloride, silazane, polyglycerylsilicate or other silicate precursor.

41. A method according to claim 40 wherein the carrier is derived by a sol-gel processing method.

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47. A method according to claim 46 wherein the signal is detected in a time-gated or time resolved mode.

48. A method of detecting signals generated by an array according to claim 47 wherein the signal is excited by a laser, lamp or light emitting diode, either directly or through an optical fiber, and fluorescence is detected using a CCD camera.

5 49. A method of normal or frontal affinity chromatography for pre-screening a substance for binding or inhibiting a bimolecular interaction comprising:

incorporating a bimolecular interaction or individual protein partners within a carrier;

placing said carrier in a column;

10 adding a denaturant;

passing said substance including an indicator ligand through the column in conjunction with removal of the denaturant; and

determination of retention behaviour by fluorescence or mass spectrometry .

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Table 1. Reversibility of disruption for entrapped BCaM:melittin.

	Relative Intensity	Anisotropy	Wavelength Maximum
Native	100	0.129	334 nm
Denatured	40	0.099	346 nm
Recovered	104	0.136	330 nm

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[illegible]

TABLE 2

	Anisotropy	Wavelength (nm)
Native	0.129	334
Denatured	0.099	346
Recovered with no TFP	0.136	331
Denatured, TFP added	0.115	346
Recovered with TFP	0.121	346

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f_i = fractional fluorescence of component i , τ_i = lifetime of component i , $\langle \tau \rangle = \sum f_i \tau_i$